

CLAIMS

1. A process for preparing a supported catalyst or catalyst precursor containing carbon, said process comprising:
  - 5 a. preparing a liquid mixture of (i) at least one catalyst support or catalyst support precursor; (ii) at least one metal-containing compound, wherein said metal is selected from V, Cr, Mn, Fe, Co, Ni, Cu, Mo and W, and (iii) 10 at least one polar organic compound which acts as a solvent for the metal-containing compound, said liquid mixture comprising 0 to 20 wt% of water based on the total weight of the mixture;
  - 15 b. converting said mixture to a paste or solid residue; and
  - 20 c. combusting the residue in an oxygen-containing atmosphere to at least partially convert the organic compound to carbon and to form said supported catalyst or catalyst precursor.
2. A process according to claim 1 wherein the polar organic compound is liquid at 20°C.
3. A process according to claim 1 wherein the polar 25 organic compound is solid at 20°C and the liquid mixture is formed by melting the polar organic compound.
4. A process according to any one of the preceding claims in which the liquid mixture comprises a solid catalyst 30 support and the metal-containing compound dissolved in the polar organic compound.

5. A process according to any one of claims 1 to 3 wherein the catalyst support precursor is dissolved in said liquid mixture and forms the support during the heating and/or the combustion step.

5

6. A process according to any one of the preceding claims wherein the liquid mixture comprises water.

7. A process for preparing a supported catalyst or catalyst precursor containing carbon, said process comprising:

a. preparing a mixture of (i) at least one porous catalyst support and (ii) at least one organic compound in a solvent, said mixture comprising 0 to 20 wt% of water based on the total weight of the mixture;

b. removing the solvent such that the organic compound is deposited in the pores of the catalyst support;

c. mixing the catalyst support with a solution of at least one metal-containing compound and removing the solvent to form a solid residue or kneading or mechanical mixing the catalyst support with at least one metal-containing compound, wherein said metal is selected from V, Cr, Mn, Fe, Co, Ni, Cu, Mo and W; and

d. combusting the resultant solid in an oxygen-containing atmosphere to at least partially convert the organic compound to carbon and to form said supported catalyst or catalyst precursor.

8. A process according to any one of the preceding claims, which further comprises incorporating a metal-containing promoter or modifier, wherein the metal is at least one of

Zr, U, Ti, Th, Hf, Ce, La, Y, Mg, Ca, Si, Cs, Rb, Mo, W, Cr, Mg, rare earth metals and noble metals.

9. A process according to any one of the preceding claims  
5 wherein the polar organic compound is an organic amine,  
amide, urea, an organic carboxylic acid, an alcohol, an  
amino acid, a heteroaromatic compound or a surfactant.

10. A process according to claim 9 wherein the polar  
10 organic compound is urea, a citrate or citric acid.

11. A process according to any one of the preceding claims  
wherein the final catalyst or catalyst precursor support is  
an oxide, carbide, oxycarbide, zeolite, or boronnitride.

15 12. A process according to any one of the preceding claims  
where the combustion is carried out for 15 minutes or less.

13. A process according to any one of the preceding claims  
20 wherein the combustion is carried out in air.

14. A process according to any one of the preceding claims  
where the combustion is carried out at a temperature of from  
150 to 1000°C.

25 15. A process according to any one of the preceding claims  
where the catalyst or catalyst precursor before activation  
comprises carbon in an amount of up to 8 wt% based on the  
total weight of the catalyst or catalyst precursor.

30 16. A process according to any one of the preceding claims  
wherein the catalyst or catalyst precursor is a Fischer-

Tropsch synthesis, hydrotreating, hydrocarbon partial oxidation, steam reforming or carbon dioxide reforming catalyst or catalyst precursor.

5 17. A process for carrying out a Fischer-Tropsch synthesis, hydrotreating, hydrocarbon partial oxidation, steam reforming or carbon dioxide reforming reaction, which comprises catalysing said reaction with a catalyst prepared by a process as defined in claim 15.

10

18. A Fischer-Tropsch synthesis catalyst or catalyst precursor comprising, on an inert support,

i) 10 to 40 wt% cobalt, nickel or a mixture thereof;  
ii) 1 to 10wt% at least one promoter selected from  
15 zirconium, uranium, titanium, thorium, hafnium, cerium, lanthanum, yttrium, magnesium, calcium, strontium, cesium, rubidium, molybdenum, tungsten, chromium, manganese, and rare earth elements; and  
iii) carbon in an amount of up to 8 wt%;  
20 the above percentages being based on the total weight of the supported catalyst.

19. A steam reforming catalyst or catalyst precursor comprising, on an inert support,

25 i) 0.1 to 30 wt.% cobalt, nickel or a mixture thereof;  
ii) 0 to 10 wt.% of at least one promoter selected from sodium, potassium, uranium, titanium, thorium, hafnium, cerium, lanthanum, yttrium, magnesium, calcium, strontium, cesium, rubidium, molybdenum, tungsten, chromium, manganese  
30 and rare earth elements; and  
iii) carbon in an amount of up to 4 wt.%;

- 38 -

the above percentages being based on the total weight of the supported catalyst.